

**EVALUATION OF INTEGRATED SAFETY MANAGEMENT
AT LAWRENCE BERKELEY NATIONAL LABORATORY**

DRAFT WORK PLAN

September 2006

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INTEGRATED SAFETY MANAGEMENT SYSTEM REVIEW OF LAWRENCE BERKELEY NATIONAL LABORATORY Work Plan

1.0 Background, Objectives and Assumptions

The Lawrence Berkeley National Laboratory (LBNL) has requested that a review of the Integrated Safety Management System (ISMS) at LBNL be conducted. LBNL desires that this ISMS review emulate – to the extent practical – the general approach used by the DOE Headquarters Office of Independent Oversight and Performance Assurance in performing reviews of ISMSs. The Laboratory has requested that a highly credible Review Team of recognized experts be identified with broad experience in, and understanding of, ISMS, laboratory operations, and the critical principles under which the Laboratory is managed with respect to its ISMS. As part of this review, the Berkeley Site Office (BSO) has requested that an evaluation of its ISMS functions and processes also be examined by the same Review Team.

The objectives of this review are to:

- Determine the overall effectiveness of the LBNL ISMS in satisfying the DOE requirements for integrated safety management;
- Determine the ISMS implementation effectiveness of selected elements of the Laboratory's programmatic missions and operations with respect to the five Core Functions (and Guiding Principles 1-3 and 5) of ISM;
- Identify areas of vulnerability, gaps and weaknesses with respect to the five Core Functions (and Guiding Principles 1-3 and 5) of ISM;
- Identify areas of strength and/or best practices with respect to the five Core Functions (and Guiding Principles 1-3 and 5) of ISM;
- Evaluate the effectiveness and rigor of selected ISMS-related processes of the Berkeley Site Office (if requested); and
- Provide recommendations for improvements in ISMS program design and/or implementation, as applicable, which could lead to or form the basis for downstream Laboratory corrective actions.

Critical assumptions for this review include:

- The review will focus on and be organized around the five ISM Core Functions and Guiding Principles 1-3 and 5.
- The Review Team will consist of three McT personnel (Turner, McCallum, and Doug Schlagel); seven to eight Office of Science contractor personnel; and, one DOE person.

- The DOE person will conduct the BSO Review; the balance of the Review Team will examine LBNL.
- LBNL will identify a key point of contact who will work closely with the Review Team in ensuring identification and timely availability of critical documents (prior to the second site visit), resources, and access to needed personnel for interviews, etc.
- The onsite assessment will require approximately 1.5 weeks.
- A planning trip of two days on site for selected Team members – at a minimum this will be Messrs. McCallum and Turner – will occur well in advance of the onsite review.

2.0 Overall Review Principles

There are a number of key principles that will guide the ISMS review are as follows:

- The Review Team will examine the ISMS as it is designed and implemented at LBNL – at the institutional, division/department, and program/activity levels.
- Special emphasis will be placed on user facilities because of the inherent challenges and risks associated with ensuring that non-UC/LBNL personnel are appropriately cognizant of work place hazards and fully competent in the safe implementation of necessary hazard controls.
- The Review Team will consider how the ISMS is reflected in the interplay of the safe management of facilities (and their attendant risks) and the safe conduct of work/research within those facilities.
- The Review Team will determine the extent to which the ISMS – as it is articulated in documents and implemented in practice – is consistent with DOE expectations.
- The Review Team will use the criteria and expectations as outlined by the DOE Headquarters Office of Independent Oversight and Performance Assurance, DOE Order 226.1, and other key DOE documents (DOE Policy 450.4) as the requirements framework (set of DOE expectations) for both the review of LBNL and BSO.
- The Review Team will structure the onsite review to sample key elements of the Laboratory's programmatic and operations missions with respect to conformance to ISMS expectations.
- The review will examine both research and development activities – that is, those performed by the four science directorates (Life & Environmental Sciences, Physical Sciences, Computing Sciences, and General Sciences) – and – operations and maintenance-related activities – that is, those performed by the Operations Directorate (Facilities and EHS).

- The approach to understanding the ISMS at the science bench top will involve direct interactions between Review Team members and LBNL researchers. The Review Team will propose a sampling approach, which will be intended to view elements within each of the four science Directorates with emphasis being placed on those organizations having higher risk (e.g., hazard profile, recent performance, proportion of visitors/guests/students, etc.).
- Specific operations activities to be examined will likely be based on such factors as: risk, recent performance, and availability at time of onsite review. Assigned Team members will likely observe “plan-of-the-day” activities and then “shadow” maintenance and operations personnel.
- Subject to approval by the Laboratory, the Review Team will take advantage of and observe any ISMS-related activities occurring during the period of the onsite review. This might include, for example, event critiques or performance reviews.
- Interviews will be conducted with personnel from across the Laboratory and Site Office organizations (e.g., senior managers, first line supervisors, principal investigators, researchers, technicians, maintenance and operations personnel, and ESH personnel).
- To increase the breadth and depth of the sample, both one-on-one and group interviews will be conducted. Group interviews will typically be personnel with like job responsibilities from one or more organizations and with no supervisory-subordinate relationships present within a given group interview.
- The review will result in two separate out-briefings (one for BSO and one for LBNL) and two separate reports (one for BSO and one for LBNL).

3.0 Approach

The overall review project is defined in terms of three overarching activities: Planning, Onsite Review, and Report Development.

3.1 Planning

Planning will span the period from project initiation up to the point of the start of the onsite review. Key planning activities include the following:

- Establishing the assessment scope – including execution of the scoping visit.
- Identifying the Review Team.
- Allocating work assignments among Review Team members.
- Identifying and communicating logistical needs while onsite and communicating such to LBNL (e.g., office space, computer support, site access, training requirements).

- Identifying key documents to review – both before and during the on-site review (Appendix A)
- Identifying key personnel to interview (e.g., Berkeley Site Office personnel, senior managers, first line supervisors, principal investigators, researchers, technicians, maintenance and operations personnel, and ESH personnel; Appendix B).
- Developing lines of inquiry based on the DOE Headquarters Office of Independent Oversight and Performance Assurance criteria and related governing documents and developing detailed work plans (Appendix C).
- Conducting Review Team teleconferences to ensure understanding of roles and to track planning progress.
- Ensuring scheduling of interviews, etc.

3.2 *Onsite Review*

The onsite review is proposed to occur over a 1.5 week period in late September. Key aspects of the onsite review include the following:

- An in-briefing for the key LBNL and Berkeley Site Office personnel to introduce the team, reaffirm review objectives, and outline expected activities for the review.
- End of day Review Team (only) meetings to discuss results, observations, and to identify additional interview or document needs.
- Early morning informal meetings with key Laboratory personnel (if desired) to convey key observations, safety issues (if any), and logistical needs or changes.
- A separate out-briefing to BSO and to LBNL to summarize key observations and conclusions from the onsite review and to provide the framework for the factual accuracy reports.

3.3 *Report Development*

Report development includes all activities commencing with the creation of an annotated outline and concluding with transmittal of final reports (to BSO and to LBNL). Key elements include:

- Establishing an annotated outline for the report, providing to BSO and LBNL for review, and modifying as appropriate.
- Allocating writing assignments among Team members.
- Developing a draft factual accuracy reports following completion of the onsite review and transmittal to BSO and LBNL.

- BSO and LBNL review of factual accuracy reports and transmittal of consolidated comments to Team.
- Development and transmittal of the final reports.

4.0 Schedule

The initial schedule of activities is expected to be follows:

- | | |
|---|-------------------------------------|
| ▪ Identify draft assessment scope | Week of August 1 |
| ▪ Support identification of Team members | Week of August 1 |
| ▪ Establish agenda for Scoping Visit | Week of August 1 |
| ▪ Conduct scoping visit to Laboratory ¹ | Week of August 7 (2 day visit) |
| ▪ Identify key references | Week of August 7 (2 day visit) |
| ▪ Identify key interviewees | Week of August 7 (2 day visit) |
| ▪ Establish logistical needs for onsite visit | Week of August 7 (2 day visit) |
| ▪ Management calls for overall LBNL ISMS review | Weekly from August 7 – September 11 |
| ▪ Assign scope areas to Review Team members | August 11 - 14 |
| ▪ Develop lines of inquiry, review materials, etc. | August 14 – September 15 |
| ▪ Receive and review selected key documents | August 14 – September 15 |
| ▪ Design report and briefing templates | August 14 – September 15 |
| ▪ Conduct onsite in-briefing and interview activities | September 19-27 |
| ▪ Provide periodic updates and out-briefing to BSO and LBNL personnel | September 19-27 |
| ▪ Prepare factual accuracy reports to BSO and LBNL | October 11 |
| ▪ Prepare final reports to BSO and LBNL | 1 week after receipt of comments |

¹ The objectives of the Scoping Visit will be to finalize the assessment scope, identify key references, identify key interviewees, and establish logistical needs for the assessment team while onsite and prior to the onsite assessment visit.

5.0 Team Assignments

- Larry Kelly, DOE ORO Berkeley Site Office

- Ed Lessard, BNL Large Scale Research, User Facilities, CF1-5, GP3
- Tom Mullen, ANL Large Scale Research, User Facilities, CF1-5, GP3

- Larry McClellan, PNNL Laboratory Activities, CF1-5, GP3
- Pat Wright, PNNL Laboratory Activities, CF1-5, GP3

- Mike Bebon, BNL Facilities and Operations, CF1-5, GP3
- Chris Johnson, BNL Facilities and Operations, CF1-5, GP3

- Carol Scott, ORNL Worker Safety, CF1-5, GP3
- Doug Schlagel, McT Industrial Safety, CF1-5, GP3

- Carol Scott, ORNL Waste Management/ Environmental Protection, CF1-5, GP3
- Doug Schlagel, McT Waste Management/Environmental Protection, CF1-5, GP3

- Bob McCallum, McT Institutional Processes (Self-Assessment, Feedback and Improvement, Contractor Assurance), GP1-2 & 5, CF5
- Kyle Turner, McT Institutional Processes (Self-Assessment, Feedback and Improvement, Contractor Assurance), GP1-2 & 5, CF5

6.0 Review Team Roster

Mike Bebon

Brookhaven National Laboratory

bebon@bnl.gov

ofc: 631-344-3434

fax: 631-344-2631

Chris Johnson

Brookhaven National Laboratory

johnsonc@bnl.gov

ofc: 631-344-7636

fax: 5874

Larry Kelly

Oak Ridge Operations Office

kellylc@oro.doe.gov

ofc: 865-576-0891

fax: 865-576-5038

Ed Lessard

Brookhaven National Laboratory

lessard@bnl.gov

ofc: 631-344-4250

fax: 631-344-5954

Bob McCallum

McCallum-Turner, Incorporated

McCallum.Turner@prodigy.net

ofc: 410-268-7415

fax: 410-268-7416

cell: 240-446-6298

Larry McClellan

Pacific Northwest National Laboratory

larry.mcclellan@pnl.gov

ofc: 509-376-6211

Tom Mullen

Argonne National Laboratory

tmullen@anl.gov

ofc: 630-252-2879

Doug Schlagel, PE, CHMM

McCallum-Turner, Incorporated

Doug.Schlagel@comcast.net

ofc: 303-683-5711

cell: 720-670-0264

Carol Scott

Oak Ridge National Laboratory

scottch@ornl.gov

ofc: 865-241-1550

Kyle Turner

McCallum-Turner, Incorporated

kylturn@att.net

ofc: 303-670-8797

fax: 303-670-8797

cell: 303-808-2457

Patrick A. (Pat) Wright

Pacific Northwest National Laboratory

Pat.Wright@pnl.gov

ofc: (509) 376-3016

fax: (509) 373-0792

cell: (509) 521-0481

APPENDIX A

Documents/Elements to be Reviewed

Overarching Plans

- ISM Plan
- Strategic Plan
- Annual Operating Plan
- Quality Assurance Program Plan
- Requirements Management Process

R&D Experimental Planning and Execution

- Experimental Planning Process
- Hazard Analysis and Controls Process
- Authorization Process
- Management Observations
- Feedback and Improvement

Maintenance and Operations Activities

- Work Planning Process
- Hazard Analysis and Controls Process (JHA, JSA)
- Work Authorization
- Pre-Job Briefings
- Work Observations
- Worker Involvement/Feedback and Improvement

Performance Management

- Contractor Assurance Plan/Process
- Self-Assessment Process
- Event/Occurrence Reporting Process
- Causal Analysis Process
- Corrective Action Management Process
- Trending and Analysis of Performance

Worker Safety and Health

- Radiation Protection Program
- Industrial Safety Program
- Industrial Hygiene Program

Waste Management/Environmental Protection

- Waste Management/Certification Process
- Environmental Monitoring

Training and Qualifications

- Process for T&Q of R&D personnel
- Process for T&Q of Students, Visitors, etc.
- Process for T&Q of Maintenance and Operations personnel

APPENDIX B
Personnel to be Interviewed

The Review Team has developed a Master Interview List (in Excel format), which was provided as a separate (Excel) file to the Laboratory.

APPENDIX C

Detailed Work Plans

Work Plans associated with each of the five sub-teams are provided in this appendix. They include:

- Institutional Processes (C.1)
- Large Scale Science (C.2)
- Bench Scale Science (C.3)
- Maintenance and Operations (C.4)
- Worker Safety and Waste Management/Environmental Protection.(C.5)

Several notes:

1. Each work plan addresses
 - a. Scope
 - b. Areas of Interest
 - c. Interviews
 - d. Walk-throughs
 - e. Documents
 - f. Lines of Inquiry
2. The lines of inquiry in each work plan are extracted from the generic Inspection Plan document used by Department of Energy Headquarters for independent ES&H reviews (i.e., *The Department of Energy Office of Independent Oversight Office of Security and Safety Performance Assurance Plan for Environment, Safety, and Health Programs*) as well as related documents used by that office.
3. The proposed interviews identified in each work plan have been consolidated and provided to the LBNL as a separate (Excel) file.

C.1 Institutional Processes Work Plan

1.0 Scope of Work Plan

- Contractor Assurance
- Assessment Processes
- Corrective Action Management
- Work Smart Standards

2.0 Areas of Interest

- Contractor Assurance
 - Program Documentation
 - Structure/Organization of Program
 - Safety Review Committee (SRC)
 - SRC Sub-committees
 - Roles and Responsibilities
 - Program Effectiveness
- Assessment Processes
 - PEMP
 - MESH
 - IFA
 - Division Self-Assessments
 - Integration of Performance Information
- Corrective Action Management
 - Event Reporting
 - Causal Analysis Process
 - CATS
 - Trending and Analysis
- Work Smart Standards
 - Update process
 - Impact on Work Controls and Work Authorization
- Line Accountability
 - Clarity of safety roles and responsibilities
 - Roles and responsibilities of line organization
 - Roles and responsibilities of EHS professionals
 - Establishment of accountability

3.0 Interviews

1. Steven Chu
2. Member of Contract Assurance Council (see David McGraw)

3. David McGraw/Sandy Merola
4. Jim Krupnick/John Chernowski (first interview – may require follow-up)
5. Howard Hatayama
6. EH&S WSS Coordinator – Ross Fisher
7. George Reyes (Mike Bebon will probably obtain what is needed)
8. 2 R&D Associate Laboratory Directors (not Computing Sciences)
9. 3 Division Directors (1 each from Life & Environmental, Physical, and General Sciences Directorates)
10. 1 Group Interview with 6 PIs (2 each from Life & Environmental, Physical, and General Sciences Directorates)
11. 1 Group Interview with 6 Post Docs (2 each from Life & Environmental, Physical, and General Sciences Directorates)
12. Group interview with 2 members of Safety Review Committee
13. Group interview with 2 members of Laboratory Support Advisory Council (see David McGraw)
14. Employee Concerns Program Manager
15. Lessons Learned Program Manager (R&D teams)
16. CATS Program Manager

4.0 Walkthroughs - None Planned for this scope of work

5.0 Documents

- Department of Energy Laboratory Plans
- UC Assurance Plan for LBNL, October 2005
- LBNL Operating and Assurance Plan, April 2000
- Work Smart Standards Update Process
- PUB-3140, Integrated Environment, Health and Safety Management Plan
- PUB-5344, Environment, Safety and Health Self-Assessment Program
- PUB-3000, Chapter 5 – Causal Analysis
- LBNL Corrective Action Tracking System
- LBNL Occurrence Reporting and Processing System

6.0 Lines of Inquiry

Contractor Assurance System (CAS) – See DOE 226.1, Attachment 2 (including Appendix A)

- Has LBNL performed a requirements analysis for DOE O 226.1 as part of establishing its CAS – particularly Attachment 2?
- Has LBNL determined the extent to which the functions and processes that constitute its CAS meet the requirements of DOE O 226.1?
- Where is the overall CAS described?
- Has a Program Description document been developed and approved?
- Does LBNL submit to DOE annually a CAS program description?
- To what extent does the CAS address all LBNL work, including subcontractors?
- Have personnel knowledge, skill, abilities been established for persons implementing CAS?
- Are personnel performing CAS functions adequately trained and qualified?

- Has LBNL verified the training and qualifications of personnel performing CAS functions?
- How is the effectiveness of CAS elements determined?
- Has LBNL established external mechanisms to ensure CAS program effectiveness?
- How are results of CAS processes communicated to DOE?
- To what extent are the results of CAS processes analyzed and communicated to DOE in the form of contract evaluations?
- How is the performance information generated from the various self-assessment activities integrated to provide a more holistic understanding of Laboratory performance?

Assessment Processes

- Have formal processes and associated procedures been established for conducting self-assessments?
- Does the suite of assessment activities address all work performed at LBNL including subcontractor activities?
- Are self-assessment activities conducted at all levels of the organization?
- Are institutional programs periodically evaluated?
- To what extent are self-assessment activities risk-based?
- To what extent do self-assessment activities include work observations?
- How are the skills of personnel involved in conducting assessment activities established?
- Have performance indicators been established to measure overall performance and trends?
- Are performance indicators periodically reviewed for relevancy and effectiveness?
- To what extent does LBNL review the effectiveness of these processes?
- Are independent assessment activities conducted, which include among other elements determining the effectiveness of aspects of the CAS?
- Is self-assessment process adequately linked with the corrective action management process?

Corrective Action Management Process

- Do procedures exist for identifying, documenting, analyzing, and managing issues?
- Are personnel performing these functions appropriately trained and qualified?
- Are appropriate organizations involved in the identification, assessment, and development of corrective or mitigating actions?
- Is the process of documenting and reporting corrective actions formal and traceable?
- Are immediate and compensatory actions taken as appropriate to events?
- Are the risk significance, and priority of events identified?
- Is there a graded approach applied to the evaluation of underlying causes and using this information as the basis for identifying corrective actions?
- Is the extent of condition of an event evaluated as appropriate?
- How is the process of trending and analysis conducted? Are such processes formal, well documented, and readily understood?
- Does a process exist for identifying and trending lower level issues?
- Does the process of analyzing events include a graded or tailored approach to causal analysis?
- Are persons performing such analysis appropriately trained and qualified?
- Does the process include provisions for corrective action verification?

- Does the process include provisions for graded reviews of corrective action effectiveness and long-term sustainability?
- Is the entire suite of corrective action processes periodically evaluated for effectiveness?
- Do formal processes exist to identify LL from internal and external sources and disseminate such to targeted audiences?
- To what extent do LBNL managers exchange LL with the rest of the DOE complex?
- What processes exist to solicit feedback from workers on all aspects of Core Functions 1-4?
- Does a process exist for addressing Employee Concerns (see DOE O 442.1A)

Work Smart Standards

- Describe the overall WSS process?
- What are the key roles and responsibilities for the WSS process?
- What is the mission and function of the Steering Committee and the Advisory Committee?
- Does each of the Teams in the Standards Review element of the update process have specific/formally defined scopes?
- Is the Operational (Work and Hazard Review) always an element of the update process?
- How are changes to the WSS set translated into new policy, procedure and practice?
- Who is the Laboratory custodian of these changes?
- How is a determination made as to whether additional training or related instruction should accompany changes to the WSS set?
- Has a self-assessment been conducted of the WSS process?
- What is the BSO perspective of the WSS process (see Larry Kelly)?

Line Accountability

- How are safety roles and responsibilities established?
- How are they conveyed to personnel at LBNL?
- To what extent are they understood, accepted, and followed in practice?
- Are safety authorities sufficient to enable personnel to exercise their roles & responsibilities?
- To what extent is it clear that the line organization is accountable for safety performance?
- Do line managers have explicit safety expectations that articulate the safety behaviors and responsibilities of managers and leaders at LBNL?
- What roles do EHS professionals play in this process?
- What is the function of Safety Coordinators? Safety Liaisons?
- Are these roles understood, accepted, and followed in practice?
- How are personnel held accountable for safety performance?
- What are the safety expectations, roles and responsibilities of Principal Investigators?
- To what extent are these expectations achieved in practice?
- What are the safety expectations, roles and responsibilities of Post-Doctoral students?
- To what extent are these expectations achieved in practice?
- What level of management presence is expected in laboratory areas?
- What level of management presence occurs in practice?
- How do safety expectations at LBNL compare and contrast with those at UC for work conducted on behalf of DOE?

C.2 Large Scale Science Work Plan

1.0 Scope of Work Plan

- Conduct of Operations
- Accelerator Safety Order
- Environmental Management System
- Safety and Health Management System
- Training and Qualifications
- Quality Assurance

2.0 Areas of Interest

- Conduct of Operations
 - Organization and Administration
 - Shift Routines and Operating Practices
 - Control Area Activities
 - Communications
 - Control of On-Shift Training
 - Investigation of Abnormal Occurrences
 - Notifications
 - Control of Equipment & System Status
 - Lockouts and Tagouts
 - Independent Verification
 - Logkeeping
 - Operations Turnover
 - Operations Aspects of Unique Processes
 - Required Reading
 - Timely Orders to Operators
 - Operations Procedures
 - Operator Aid Postings
 - Equipment Labeling and Piping
- Accelerator Safety Order
 - Authorizations
 - Safety Assessment Document
 - Accelerator Safety Envelop
 - Shielding Policy
 - Shielding Calculations
 - Unreviewed Safety Issue Program
- Environmental Management System
 - NEPA Documentation
 - Modifications/Changes to Facility and NEPA Evaluation Process
 - Process Evaluations
 - Permits

- Safety and Health Management System
 - Hazard and Risk Assessments
 - Electrical Safety Program
 - Radiation Safety Program
 - Work Planning and Control
- Training and Qualifications
 - Procedures
 - Training Programs
 - Training Records
- Quality Assurance
 - Records Management
 - Configuration Management
 - Preparing and Issuing Drawings and Specifications
 - Nonconformance and Corrective and Preventive Action Management
 - Calibration
 - Independent Assessment

3.0 Interviews

88 Inch Cyclotron

1. Claude Lyneis - Program Head
2. Daniela Leitner - Accelerator Physics and Source Group Leader
3. Peggy McMahon - Research Coordinator and Beamline Support Group Leader
4. Jim Morel - Operations Group Leader
5. Gudrun Kleist - Electrical Group Leader
6. Bob Shannon - Mechanical Group Leader
7. Dennis Collins - Bld Manager, RF Engineer, and Safety Committee Chairman
8. Jeff Bramble - EHS Support
9. Tom Gimpel, Brien Ninemire, Reba Siero, Ray Thatcher - Control Room Operators
10. Doyle Byford and Bill Lau - Electronic Maintenance
11. Jime Rice - Electronic Installation
12. Steve Warner - Electrician
13. Tim Doolin, Bill Tiffany, Jeff Trigg - Mechanical Technicians
14. Tom Perry - Machinist
15. Michelle Galloway and Damon Todd - Accelerator Physics and Source Group
16. Mike Johnson - Beamline Support
17. Carl Lionberger and Tim Loew - Engineering Support
18. Group Interview with 2 through 6 above
19. Group Interview with 11 through 17 above

Advanced Light Source

1. Director of ALS Division
2. Deputy for Science
3. Deputy for Operations
4. Deputy for Planning and Administration
5. Accelerator Physics Group
6. Controls Group
7. Electrical Engineering Group
8. Experimental Systems Group
9. Mechanical Engineering Group
10. Operations Group (Group Interview with line of direct accountability from the Operations Group Lead down to the operator)
11. Scientific Support Group (Group interview with direct line of accountability from the SS Group Lead down to the technician)
12. Group Interview with 2 Beamline Coordinators
13. Group Interview with 5 to 7 Beamline Physicists
14. Group Interview with 2, 3, and 4 above
15. Group Interview with one supervisor from each Group in 5 through 9 above
16. Group Interview with one worker from each Group in 5 through 9 above
17. Group Interview with 5 to 7 users, including at least 2 Berkeley users
18. Beamline Review Committee Chair
19. Group Interview with ESH Division Staff at ALS and ALS ESH staff
20. Group Interview with at least two QUEST Teams
21. Group Interview with ESH Committee

4.0 Walkthroughs

- 88 Inch Cyclotron
- Advanced Light Source

5.0 Documents

- Safety Assessment Documents
- Hazard Analyses
- Unreviewed Safety Issue Documents
- Past audits and assessments

6.0 Lines of Inquiry (Examples for two areas, work planning and electrical safety)

Work Planning

- Are safety-related procedures incorporated into work planning and hazards analysis processes?
- Are these procedures kept up to date?
- Are work planners using the latest revision?
- Does the training provided on work planning address safety procedures?
- Are training records maintained and up to date?
- Are attendance records maintained and up to date?
- Do subcontractors attend the site training?
- Does the subcontractor provide equivalent training?
- Do subcontracts mandate compliance with the site safety program and require that work planning processes are consistent with site procedures?
- Do contractor records demonstrate that the appropriate actions were taken for inadequate or improper safety work plans, including disciplinary actions where appropriate?
- Have subcontractors effectively implemented their safety programs, and do they prepare effective work packages for work?
- Have work planning process records been internally audited for frequency, rigor, and corrective action monitoring?
- Are managers, safety engineers, and SMEs responsible for conducting walkthroughs, and has the frequency of these walkthroughs been determined?
- Have work planning documents been reviewed by engineering or SMEs for configuration conditions and proper isolation points?

Lockout/Tagout (LOTO) Process

- Do comprehensive LOTO procedures exist?
- Are these procedures maintained up to date?
- Are work planners using the latest revision?
- Is training provided on the LOTO program and procedures?
- Are training records maintained up to date?
- Are attendance records maintained up to date?
- Do subcontractors attend LOTO training?
- Do subcontractors provide equivalent LOTO training?
- Are subcontractors required to comply with site LOTO procedures?
- Do records demonstrate that necessary actions were taken for procedure noncompliance, including disciplinary actions where appropriate?
- Do subcontractors effectively implement LOTO procedures?
- Are SMEs, electrical engineers, or managers involved in task walkdowns, task planning, and field support when unexpected conditions arise?
- Are LOTO process records internally audited for frequency, rigor, and corrective action monitoring?
- Do managers, safety engineers, or SMEs conduct field walkthroughs and has the frequency

- of these walkthroughs been determined?
- Are work planning documents reviewed by engineering or SMEs for configuration conditions and proper isolation points?
 - Do comprehensive procedures for performing zero-energy checks and energized work exist?
 - Are these procedures kept up to date?
 - Are work planners, supervisors, and workers using the latest revision?
 - Are decisions to work on energized lines documented and authorized at the appropriate management level? Are electrical safety SMEs involved in decisions to work on energized lines or equipment?
 - Does training on energized work procedures address proper energized/de-energized practices, high-energy tools, and PPE?
 - Are training records maintained up to date?
 - Are attendance records maintained up to date?
 - Do subcontractors attend the training?
 - Do subcontractors provide equivalent training?
 - Do subcontracts require compliance with site procedures governing zero-energy checks and energized work?
 - Do records demonstrate that appropriate actions were taken for procedure noncompliance, including disciplinary actions?
 - Do subcontractors effectively implement zero-energy checks and energized work procedures?
 - Are SMEs, electrical engineers, or supervisors involved in task walkdowns, task planning, and checking or overseeing energized work?
 - Are records of zero-energy check and energized work processes internally audited and evaluated for frequency, rigor, and corrective action monitoring?
 - Are managers, safety engineers, or SMEs responsible for conducting periodic walkthroughs and has the frequency of these walkthroughs been determined?
 - Have work planning documents for energized work been reviewed by engineering or SMEs and justifications properly validated?

C.3 Bench Scale Science Work Plan

1.0 Scope of Work Plan

- **Scope** = Bench Scale R&D
- **Assessment Approach** = Combination of targeted interviews, facility walkthroughs, and document reviews

2.0 Areas of Interest

- Interview Areas of Interest: Strategic roles/combinations of roles – focus of interviews based on areas of interest below (as appropriate)
 - Institutional/Division systems and processes related to ISMS CF 1-5 and GP 3 for “bench level” R&D
 - Work planning & control
 - Work authorization
 - Roles, responsibilities, authorities, and accountabilities
 - Competence (commensurate with responsibility)
 - Assessment
 - Performance Measurement
 - Feedback and improvement
 - Assurance
- Walkthroughs: Typical/cross-section of buildings/facilities/Divisions/capabilities
 - Facility condition
 - Staff working conditions/work ethic/competence
 - Hazards/hazard controls
 - Informal interviews
 - LBNL/UCB ISMS integration/implementation

3.0 Interviews

1. ⁱSafety Liaison – Most experienced (not John Seabury) and least experienced (2)
2. ⁱSafety Coordinator – Most experienced (after Rick and Tony) and least experienced (2)
3. ^gDivision Director/Safety Coordinator – Division (with laboratory activities) that has the best safety performance and a lower-performing Division (different than previous Safety Coordinator choices) (2)
4. ^gGroup interview with all Safety Liaison/Safety Coordinator for R&D Divisions (1)
5. ^gTwo PIs from each Research Division (including several PIs that do off-site field work – outside of LBNL or UCB facilities) (also including PIs that do work primarily in UCB facilities) (4)
6. ^gTeams of 2-to-5 staff/post-doc/grad student/guest worker (NO PIs) – one or two from each Research Division (6)
7. ^gSRC (as many as you can get together) – Coordinate with Team? (1)
8. ^gSafety Liaisons (as many as you can get together) – Coordinate with Carol and/or rest of Team? (1)

9. Dave McGraw – Coordinate with Team (1)
10. Howard Hatayama – Coordinate with Team (1)
11. Paul Blodget^(sp?) – Coordinate with Worker Safety and Health (1)

ⁱ Individual interview

^g Group interview

4.0 Walkthroughs

Walkthroughs will involve typical buildings where “bench” scale lab work is conducted, including facilities on UCB campus. Plan for opportunities to have informal interviews (escorts will be requested to not participate). Plan for 2 hr each of 6 representative facilities, across all divisions, with at least 1 or 2 on UCB campus (see schedule below). Escort should be Safety Liaison or Safety Coordinator.

Schedule

	Tues (pm)	Wed	Thurs	Fri	Mon	Tues
Interview	-	4	4	4	4	?
Walkthrough	2 fac	2 fac	2 fac	4	2	-

5.0 References

- PUB 3000
- Division ISM plans (all “bench level R&D divisions”)
- Several representative AHDs from each R&D division
- Training records for several representative staff at various levels, in various divisions (privacy will be guarded – redact strictly private info if necessary)

6.0 Lines of Inquiry

Core Function #1 - Define the Scope of Work

- Have higher-level work documents, such as project plans, been translated into discrete work packages and procedures with well-defined boundaries and interfaces?
- Is work defined at the task level such that the individuals performing the work, supervisors, planners, and appropriate ES&H personnel can readily identify the hazards and risks associated with both the work activity and the environment/location in which it is performed?
- Are work activities properly prioritized to allow adequate allocation of resources and scheduling based on the importance of the work, safety impact, and risk?
- Have adequate personnel and equipment resources been identified for the performance of work, including facility operations and routine maintenance?
- Do work-planning processes provide for early involvement of workers, and safety and health personnel, to fully define the work to allow identification of hazards?

- For R&D, experiments, projects, and modifications, are plans complete with adequate procedures, instructions, and drawings to define the work/activity?

Core Function #2 - Analyze the Hazards

- Do institutional-level ES&H procedures address the hazards analysis process at the working level, and are the procedures properly implemented?
- Are standardized hazards assessment processes developed and graded in their approach based on the complexity and risk of the activity/work, performance frequency, and initial hazard screenings?
- Are thresholds identified within the hazards analysis process to trigger appropriate involvement of ES&H professionals?
- Do the hazards analysis processes address all types of activities (e.g., project/construction, programmatic/R&D and experiments)?
- Do formal procedures guide the development of activity-level hazards analyses, such as job safety analyses (JSAs), job hazards analyses (JHAs), health and safety plans (HASPs), and activity hazards analyses (AHAs), and ensure that the hazards analyses are tailored to the specific work being performed?
- Are the results of hazards assessment documents (i.e., identified controls) integrated into technical work documents and work procedures?
- Do work control processes assure that hazards assessments are reviewed for impact when work scope and technical work document tasks are changed?
- Do planners, workers, ES&H staff, and facility management personnel walkdown work sites to identify activity-related hazards and co-located hazards, based on the risk associated with the activity?
- Are specific thresholds identified for involvement of ES&H personnel in the work control and hazards analysis processes when conditions change so that new potential hazards can be analyzed?
- Are hazards analysis documents in place for facilities, operations, and observed work activities?
- Have all hazards associated with work activities been identified and analyzed? Are hazards analyses sufficiently detailed to identify appropriate controls?
- Have hazards that are significant and/or unique to particular work activities been clearly identified and documented?
- Are hazards adequately communicated to all workers and subcontractors by way of work packages, procedures, instructions, permits, postings, training, and pre-job briefings?
- Are current/controlled documents used in hazards analyses?
- Are the hazards analysis documents reviewed for impacts when work scopes and work documents are changed?
- Have facility hazards been identified and characterized for current conditions and operations?

Core Function #3 - Develop and Implement Hazard Controls

- Are standardized hazard controls developed and used in a graded approach based on project/work complexity and risk, performance frequency, and initial hazard screenings?

- Are the types of controls (engineering, administrative, and personal protection equipment) applied in the correct sequence?
- Are the hazard controls comprehensive and adequate for maintaining planning efficiency while ensuring hazard mitigation?
- Are corresponding training requirements incorporated into controls and hazards assessments?
- Are thresholds identified for involvement of ES&H professionals in the tailoring of hazard controls?
- Are workers'/supervisors' stop-work authority and responsibilities clearly defined for unexpected hazards or safety concerns?
- Do procedures address liaisons and interfaces between facility management, tenants/users, and subcontractors to ensure that conflicts and overlapping work activities are properly coordinated and resolved?
- Is an independent safety review of the adequacy of controls provided for higher-hazard activities?
- Are parameters clearly defined and established in appropriate facility procedures, facility tenant agreements, and hazard controls for ensuring that authorization basis, facility, and other operating limits are not exceeded?
- Are approved final hazard controls from authorization basis documents and hazards analyses (JSAs, JHAs, AHAs, and HASPs) included in approved work documents, and are they adequately implemented?
- Are standardized hazard controls developed and used on a graded approach that considers work complexity, performance frequency, and the magnitude of the hazards?
- Are work documents complete with adequate procedures, instructions, and/or drawings, and are bounding conditions and limitations clearly specified?
- Are permits appropriately specified and integrated into the work package (lockout/tagout, radiation work permit, confined space, hot work, energized electrical, elevated work, etc.)?
- Is the reliability of hazard controls for higher-risk activities assessed, and are failure consequences determined and considered?
- When project/work scope and tasks are changed, are the hazard controls reviewed for impacts?
- Are personnel qualified and trained to perform the work in accordance with established controls?
- Are appropriate analytical parameters included in sampling and analysis programs?
- Are workers and appropriate safety professionals included on planning teams and involved in hazard control development? Are minimum thresholds identified that require involvement of ES&H personnel and subject matter experts based on the hazards and risk when developing work packages and during work activities?
- Do environmental and operations personnel have an adequate understanding of each other's requirements and processes to minimize environmental impacts and meet regulatory requirements?

Core Function #4 - Perform Work within Controls

- Are there formal procedures and criteria to address site/area office involvement in work authorization (such as readiness reviews and operations startup), and is the criteria appropriately based on the hazards and risk of the activity?

- Are ES&H representatives actively involved in the observation of work activities?
- Are work activities formally scheduled on the plan of the day or equivalent mechanisms to facilitate notification to affected personnel, resolution of scheduling conflicts, identification of resources and support required, prioritization with other work, and availability of required facilities and systems?
- Are pre-job briefings effective in communicating work scope, prerequisites (including training), and permit requirements to all workers? Are job-specific and area hazards adequately communicated to all workers before the start of work?
- Is there an effective process that defines the interface requirements between the facility managers, building managers, tenants, users, support organizations, and the facility maintenance organization to ensure that defined work does not overlap and cause conflicts?
- Does the work approval and authorization process define appropriate mechanisms to address significant changes in work scope or method of completion once initial approval is obtained?
- Have work activities and projects, including environmental protection activities, been properly planned, reviewed, and authorized?
- Are methods for authorizing work and readiness to perform work formal and documented?
- Is proper authorization obtained to perform the work (work or work package approval)? Is authorization obtained immediately prior to the start of work (work release – conditions adequate to start work)?
- Is the work performed consistent with the defined work scope and limitations?
- Are all precautions and prerequisites met, including facility/system configurations, hazard controls, and other conditions?
- Are training requirements and pre-job briefings completed and adequate for authorized work activities?
- Is there periodic and adequate supervision of activities, based on the risk of the work activity? Is the supervisor's span of control adequate based on the complexity of the work, the hazards, and the number of concurrent jobs being supervised?
- Do personnel adhere to work control documents, procedures, and permits, including working within defined scopes, instructions, and hazard controls, and completing required documentation?
- Are workers knowledgeable of activity/project-level instructions and competent to perform the work as described in the work documents?
- Is equipment placed in a safe condition at the end of the work activity or work shift, or properly turned over to the next shift?
- Do workers/supervisors stop activities when tasks cannot be performed as prescribed by work control documents or when safety concerns are encountered? Do workers understand their stop-work authority and responsibility?
- Are mission/production (production over safety) pressures evident during the observation of work? Do these pressures have the potential to lead to unsafe practices or a failure to follow required controls?
- Are ongoing surveys conducted to ensure that work hazards are not changing and that work controls remain effective?
- Do all personnel comply with postings, barriers, limits, sampling and monitoring requirements, stop-work limits, and personal protective equipment requirements?
- Are hazard controls effective in their ability to maintain releases to the environment as low as reasonably achievable?

- Are the environmental impacts of operations and activities properly monitored and measured?

Core Function #5 - Feedback and Continuous Improvement

Assessment and Performance Measurement

- Does line management observe the activities of their workforce to ensure that activity, facility, and institutional expectations are met? This includes assessing results, identifying process improvements, taking effective corrective actions, and sharing lessons learned.
- Are assessments conducted to determine program effectiveness and assure continuous improvement, and to collectively analyze trends and identify systematic problems?
- Are institutional and facility self-assessment activities scheduled and conducted to evaluate work activities and functional areas to improve and correct performance?
- Are uniform performance indicators, as well as mechanisms for collection of the performance indicator data, established and used?
- Are periodic independent assessments, which include evaluations of performance assurance effectiveness, performed? Have organizational self-assessment plans been established, and are self-assessments being conducted effectively?
- Has supporting documentation for assessment and performance monitoring processes (e.g., plans, charters, procedures, schedules, minutes, reports, and correspondence) been completed with adequate scope, frequency, and thoroughness?

Corrective Action and Issues Management

- Are processes and procedures in place and used by line management, facilities, and organizations to identify and promptly correct problems to ensure adherence to performance requirements?
- Has an issues management process that allows management to collectively analyze and manage all organizational deficiencies and corrective actions been established and implemented effectively?
- Are all organizations and departments using the issues management process with consistent thresholds for risk-ranking issues?
- Is a process established for reviewing and ensuring the adequacy of occurrence reports and for approving corrective action reports/plans?
- Are process improvements and corrective actions planned, implemented, and evaluated for effectiveness?
- Is issue capture, evaluation, tracking, and closure and the specified corrective actions to prevent recurrence adequate, including the extent of condition and root cause determinations?
- Are lower-level deficiencies, which may be precursors to more serious issues, documented, and tracked?

Lessons Learned

- Are procedures and/or mechanisms in place to examine the findings of internal and external assessments to identify root causes, trends, and necessary corrective actions, including processes for tracking, trending, and correcting conditions adverse to quality?

- Are trends, lessons learned, and systemic problems routinely identified and analyzed? Are the results reviewed with responsible management for appropriate improvement initiatives? Are issues identified and reported to responsible management for corrective action?
- Are lessons from operating experience within and outside the contractor organization developed and communicated for use in work planning and performance?
- Do committee meetings (e.g., safety committees, lessons-learned committees) provide effective feedback? Are committees reviewing performance, analyzing data for lessons learned, and assigning action items for improvement?
- Are both internally and externally generated lessons learned reviewed for applicability, and are corrective/preventive actions developed and implemented?
- Are lessons learned, including near-miss information and post-job reviews, consistently and appropriately incorporated into subsequent training and work documents, as well as the work control process?

Guiding Principle #3 - Competence Commensurate with Responsibilities

Staffing and Qualifications

- Are appropriate levels of qualified staff available to support safe operations?
- Is the process to address short- and long-term staffing needs effective?
- Are core competencies recognized and maintained in relation to changing site mission, work site hazards, and non-routine occurrences?
- Are strategic staffing needs integrated effectively into staffing decisions?
- Are recruiting policies and implementation strategies effective in attracting and retaining personnel with needed managerial, technical, and operational expertise and experience?

Technical Competence

- Is a process established and implemented for attainment and maintenance of competence commensurate with responsibilities (CCR)?
- Is CCR ensured before assigning responsibilities to DOE, contractors, and subcontractors?
- When facility conditions change, are personnel qualification requirements and training plans reviewed and changed as necessary?
- Does line management provide resources, allow work time for training, and hold workers accountable for meeting training requirements? Do subcontracting organizations verify workers' qualifications and provide the contractor with qualified workers?
- Is training based upon a systematic and graded approach that is commensurate with the risk and complexity of tasks and the knowledge and skills required for job performance?
- Are key indicators of worker and operating performance and lessons learned used to revise training programs to ensure that workers are meeting established performance and safety goals?
- Is technical training periodically reviewed and evaluated for content, delivery, cost-effectiveness, and adherence to learning objectives?

C.4 Facilities and Operations Work Plan

1.0 Scope of Work

- Operations authorization
- Conduct of Operations
- Facility and job risk analysis
- Work planning & control
- Subcontractor safety

2.0 Areas of Interest

- Operations Authorization
 - Safety basis documentation
 - Operational readiness reviews
 - Facility operating limits
 - Fire hazards analysis
- Conduct of Operations
 - Program documentation
 - Local implementation
- Facility and Job Risk Analysis
 - Facility risk limits
 - Facility inspections (OSHA, IH, Environmental)
 - Job hazard recognition/safety “skill of the craft”
 - Job training assessments
- Work planning & control
 - Procedure-driven work
 - Personal protective equipment
 - Work planning process decisions (worker planned level to permit level)
 - Role of ES&H Coordinators and Liaisons (in maintenance, in projects)
 - Integration of
 - Activity Hazard Documents (AHDs)
 - Integration of Division/Dept ISM plans
 - Job Hazard Questionnaires (JHQs)
 - Lessons learned
 - Use of Maximo and other integration tools
 - Worker involvement and feedback/Workers Observing Workers (WOW)
 - Change control

3.0 Interviews

1. David McGraw
2. Howard Hatayama

3. J. Chernowski
4. George Reyes
5. J. O'Hearn
6. Paul Blodgett
7. Derrol J. Hammer
8. Sarah Eary
9. Group interview with 6 craft workers
10. Group interview with 4 maintenance and operations (craft) supervisors (2 first line and 2 upper level)
11. Group Interview with Facilities Division managers of: Preventive Maintenance, Service and Response, Scheduled Work, Work Request Center & Administration, and Utilities
12. Group interview with 4 ES&H Coordinators
13. Group interview with 4 ES&H Liaisons
14. Electrical Safety Committee Chair
15. Mechanical Safety Committee Chair
16. Group interview with 3 project managers handling subcontractors
17. Group interview with 2 subcontractor construction workers

4.0 Walkthroughs

- Facilities shops
- Subcontractor construction sites (2)
- Operating plants (all); one on other than day shift
- Maintenance activities in progress in Facilities buildings, or in Facilities shops(4)
- Maintenance activities in progress in scientific division buildings (3)
- Maintenance activities in progress offsite (1)

5.0 Documents

- Examples of High Hazard Work Authorization documents
- Examples of AHDs prepared by the Facilities Division
- Facilities Division SOPs
- Most recent Lab level review report of the Facility Division's Safety Program
- Facility Division's FY05 Self Assessment and FY06 ISM plan
- DOE PEMP results for FY05 (Facilities-related measures)
- PUB 3000 – sections TBD
- Contract documents used to flow-down ISM to subcontractors
- Copies of recent work plans and permits
- Performance measures report for Facilities

6.0 Lines of Inquiry

Operations authorization

- How is safety integrated into engineering designs?

- Is an analysis of waste streams a part of engineering design?
- Is a design environmental and safety review performed to ensure adequate hazard controls have been incorporated?
- How do operating limits from safety basis and other facility authorization basis documentation flow into project definition/specifications, work orders, and procedures? Are changes allowable and who is authorized to approve them?
- Are safety systems (e.g. those identified in documented safety analyses) given priority for inspection, maintenance, repair, and re-capitalization?
- What is the percentage of preventive maintenance accomplished?
- Are maintenance histories for safety systems and components analyzed and retained?
- What triggers replacement of a safety system or components?
- Are maintenance personnel trained in suspect and counterfeit parts identification and response?
- Are permits used as intended and do they adequately capture hazards and operating limits?

Conduct of Operations

- Does the ISM Plan for the Facilities Division capture the high risk activities associated with the physical plant?
- What criteria set is used to determine if an organization, plant or facility is required to have a formal conduct of operations program?
- What is the process to transition a facility or facility modification from contractor completion to LBNL operations and maintenance?
- What configuration control is used for operations information for facilities?
- At plants, how are operational limits established, where are they listed, and who is authorized to change them?
- How familiar are first line supervisors with the Laboratory's ES&H procedures?
- Are design engineers required to identify hazards associated with operations of their completed projects and the necessary controls?
- Are current drawings and other facilities data current and available for use in hazards analysis?
- What are the training requirements for managers, supervisors, engineers, crafts and how are they established?
- Is training effectiveness and individual competency validated through testing or performance observation?
- Are training requirements linked to hazards analysis and control?
- How is training status for individual workers tracked? Is the data accessible to those planning work?
- Is worker training up to date?
- Who has stop work authority? How often is it used? Who has restart authority?
- For recurring operations, are standardized hazards analyses/controls in place?
- Is a "plan of the day" process in place for operating plants?
- When Facilities Division crafts perform work in another Division's facility:
 - Are the roles and responsibilities of the Building Manager, crafts-persons, craft supervisor, ES&H subject matter experts, and others involved, documented and understood by all?

- Is a readiness review done to assure that conditions have not changed since work planning was accomplished?
 - How are the workers made familiar with the facility-specific hazards (AHDs)?
- Is there evidence of mission/operation over safety choices being made?
- What procedures are in place for shift turnover? Are they adequate? Are they followed?
- Do workers follow procedures? How do you know?
- Is waste segregation a part of plant operating procedures?
- Are there open findings from previous conduct of operations assessments?
- How are corrective actions managed?
- **Facility and job risk analysis**
- How is “Condition Assessment Survey (CAS)” data used to assess condition of facilities?
 - Does CAS look for ES&H deficiencies?
 - How are they treated?
- How is ES&H support prioritized? By whom?
- Is there an institutional/Division risk-based standard process for hazard analysis/control?
 - Is it documented?
 - Does it cover all types of work?
 - Does it include appropriate tailoring for the specific work to be performed?
 - Who is authorized to use the process?
- Are hazards analyses/controls linked to standard operating procedures and other work documents (e.g. PM work orders)?
- How are hazards associated with the workplace factored into work by “transient workers” (e.g., Facilities Division workers performing work in another Division’s lab space)?
- What is done with Activity Hazard Documents (AHDs) once the activity is completed?
- Is the span of control for supervisors graded by risk and complexity of work?
- Is access to high risk facilities controlled? How?

Work planning & control

- How is project work, preventive maintenance, backlog reduction, and repair work prioritized and what is senior management’s involvement?
- Are the work and the associated hazards and controls adequately described in project plans, work orders, service requests, etc?
- Are adequate resources (materials, equipment, craftsperson-hours, ES&H support, and time) made available for the work? Who decides on allocated resources for a given job?
- What defines work that can be planned by the worker/supervisor and work that needs consultation with an ES&H subject matter expert?
- Are the hazards analysis responsibilities of the ES&H subject matter experts documented and understood? By them? By others?
- What percentage of jobs are formally planned and what percentage are “skill of the craft”?
- To what extent are workers involved in “formal” work planning?
- How are the hazards associated with specific PPE assessed?
 - For individual workers?

- For multi-craft jobs?
- How are chemical and industrial hazards integrated into work planning (e.g. MSDS hazards)?
- How are hazards to facility occupants, generated by the work, assessed and controlled?
- How are hazards and controls communicated to workers?
- How familiar are the workers with the processes discussed above?
- How is the work monitored to ensure that hazards were appropriately analyzed and controls are functioning as intended?
- How is work planning handled when a job changes in the field? How are the potential changes in hazards assessed and additional/revised controls decided and communicated to the workers?
- To what degree are environmental hazards/controls considered along with safety hazards/controls in work planning?
- Are post-job briefings used? When? By whom?
- Do workers participate in safety program development? How?
- Are lessons learned incorporated into work planning?
- How are corrective actions managed?
- Are there open findings from previous work planning & control assessments?
- [We will also be tracking one or more Work Orders (to be selected at random) from inception through completion. We will be looking for transaction points where safety could/should have been brought into the process].

Subcontractor safety

- Are design engineers required to identify hazards associated with the construction of their projects and the necessary controls?
 - Are they required to develop engineering controls to eliminate/mitigate hazards to a reasonable level?
 - Is that information communicated to contractors?
 - Are contractor health and safety plans required? For what level of project? Who approves them? Are they reviewed/revised as change orders occur?
 - Are the engineers' hazards/controls identifications during design used to review contractor health and safety plans?
- Is a construction safety review by ES&H subject matter experts part of the design review process?
- Do contractor selection criteria include contractor safety statistics? How?
- Is training for contractor employees in site/facility specific hazards accomplished?
- How is contractor employee competence verified?
- Is there a construction safety inspection/contractor evaluation process?
 - Who does construction safety inspection?
 - Are their required training and qualifications documented?
 - Are daily logs maintained and used to evaluate contractor ES&H performance?
 - Is contractor performance formally rated?
 - Is contractor performance on LBNL projects used in subsequent contractor selection processes?
- What actions have been taken against poorly performing contractors?

C.5 Worker and Industrial Safety and Waste Management and Environmental Protection Work Plan

1.0 Scope of Work Plan

- Worker Safety
- Industrial Safety
- Waste Management
- Environmental Protection and Compliance

2.0 Areas of Interest

Worker Safety

- Work Planning Process
- Hazard Analysis and Controls Process
- Radiation Protection Program
- Chemical Safety Program
- Industrial Hygiene Program
- Feedback and Improvement (Corrective Action, Trending, Analysis)

Industrial Safety

- Work Planning Process
- Hazard Analysis and Controls Process
- Hoisting and Rigging, Laser Safety, LOTO, Electrical Programs
- Feedback and Improvement (Corrective Action, Trending, Analysis)

Waste Management

- Work Planning Process
- Waste Collection, Inspection, and Management Program
- Waste Certification Process
- Feedback and Improvement (Corrective Action, Trending, Analysis)

Environmental Protection and Compliance

- Work Planning Process
- Identification of Environmental Controls
- Environmental Monitoring Program
- Feedback and Improvement (Corrective Action, Trending, Analysis)

3.0 Interviews

Worker/Industrial Safety

1. Safety Review Coordinators (preferably 2-3, could be scheduled as group interview)
2. Worker Safety Program Managers (group including radiation protection manager, chemical safety manager, industrial hygiene manager, others)

3. Industrial Safety Program Managers (group including, e.g., hoisting/rigging manager, laser safety manager, electrical safety manager, LOTO manager, biosafety, others)
4. Division Directors (preferably 2-3, could be scheduled as group interview)
5. Principal Investigators (group of 4-6 from varying directorates)
6. Post Docs and Students (group of 4-6 from varying directorates)

Waste Management and Environmental Protection

1. Environmental, Health, and Safety Division Director (Howard Hatayama)
2. Waste Management Coordinator
3. Waste Certification Program Manager
4. Division Directors (preferably 2-3, could be scheduled as group interview)
5. Principal Investigators (group of 4-6 from varying directorates)
6. Post Docs and Students (group of 4-6 from varying directorates)

4.0 Walkthroughs

Worker/Industrial Safety

Review team requests the opportunity to conduct walkthroughs in both Research & Development and Operations & Maintenance work areas. Walkthroughs will include observation of ISMS implementation, and will provide an opportunity to discuss ISMS concepts with staff members. Focus of walkthroughs will be radiation protection, chemical safety, industrial hygiene, and industrial safety. Walkthroughs can be coordinated with similar requests from other review teams provided sufficient number of Principal Investigators and Laboratory Technicians are available to accommodate all teams. The R&D walk-throughs would include both LBNL R&D areas and UCB R&D areas.

Waste Management and Environmental Protection

Review team requests the opportunity to conduct walkthroughs in both Research & Development and Maintenance & Operations work areas. Walkthroughs will include observation of ISMS implementation, and will provide an opportunity to discuss ISMS concepts with staff members. Focus of walkthroughs will be waste management and environmental controls. Walkthroughs can be coordinated with similar requests from other review teams provided sufficient number of Principal Investigators and Laboratory Technicians are available to accommodate all teams.

5.0 Documents

- PUB-3140, Integrated Environment, Health, and Safety Management Plan
- PUB-3000, Chapter 6 – Experimental Planning Process
- Maximo CMMS – Work Planning, Hazard Analysis, and Work Authorization for Maintenance and Operations Activities
- Workers Observing Workers (WOW) Program
- PUB-3000, Chapter 21 – Radiation Protection Program
- PUB-3000, Chapter 5 – Industrial Safety Program

- PUB-3000, Chapter 4 – Industrial Hygiene Program
- Chemical Safety Program
- PUB-3000, Chapter 20 – Waste Management/Certification Process
- PUB-3000, Chapter 11 – Environmental Monitoring
- PUB-3000, Chapter 24 – Process for Training and Qualifications for R&D Personnel
- Division ISM Plans
- PUB-5344, Environment, Safety, and Health Self-Assessment Program
- Samples of work authorization documents
- Samples of work packages with hazard/control identification and analysis (especially for work spaces targeted for walkthroughs)
- Research Safety Summaries (especially for lab spaces targeted for walkthroughs)
- Results of self-assessments and feedback observations

6.0 Lines of Inquiry

Worker/Industrial Safety

- Describe the process for planning, reviewing, and approving projects. Include involvement of both contractor and DOE managers. Are resources appropriately allocated? How are workers involved in the work planning process?
- Describe the differences in line management work (self-authorized) and formally authorized work.
- Describe how work scopes and authorization documents are clearly bounded and defined to allow complete identification and control of hazards?
- How are work activities prioritized and scheduled? What role does identified safety risk and hazard control play in this process?
- Describe the process for identifying and analyzing hazards for new and recurring tasks. Include involvement of subject matter experts and workers. How often are recurring tasks re-evaluated? How are work scope changes re-evaluated?
- How are the results of the hazard analysis process incorporated into technical work documents and work procedures?
- What types of walkthroughs are conducted to identify/validate activity-related hazards and co-located hazards? Who performs these walkthroughs? How are the results documented/used?
- How are hazards communicated to workers? How often is this performed? Are results of walkthroughs communicated to workers?
- Describe the process for identifying hazard controls. What is the sequence/hierarchy that controls are applied? How are workers involved in the identification of hazard controls? How are workers trained on the correct use of hazard controls?
- What are the roles of the Safety Review Coordinator in the identification of hazards, application of controls, and the authorization of work? Same question for Safety Liaisons.
- How do workers react to unexpected hazards or safety concerns?
- How are environmental operating limits monitored?
- How are permits specified and integrated into the work package (e.g., LOTO, radiological permits, confined space, energized work, elevated work, etc.)?

- How is readiness verified/documented prior to work authorization? What factors are considered?
- Describe the supervision of work activities and how this supervision is based on the risk of the work activity?
- What mission/production pressures are evident/perceived? How do these pressures affect risk-based decisions?
- Are ongoing surveys conducted to ensure work hazards are not changing and work controls remain effective? Who conducts these surveys? How are results documented and used?
- Describe how the ISMS process is consistently applied across all functions? Describe how the ISMS process is applied to user facilities?
- How is post-activity feedback solicited and collected? Is feedback from workers effectively solicited?
- Are performance measures established and tracked related to the conduct of this type of work activity? What are they? What are they indicating? How are they used?
- How are lessons learned (both internal and external) collected, reviewed, disseminated, and incorporated?
- How are identified deficiencies and weaknesses recorded, tracked, and corrected?
- Describe the chemical management process. How are hazardous material needs identified, reviewed, and authorized? Are surplus chemicals removed from the work area to minimize safety risks?

Waste Management and Environmental Protection

The lines of inquiry established for Worker/Industrial Safety (above) are also largely applicable to Waste Management and Environmental Protection. The following are additional lines of inquiry applicable to Waste Management and Environmental Protection.

- Are tasks for minimizing waste generation and controlling the release of pollutants to the environment adequately defined?
- How are environmental hazards associated with waste streams identified and analyzed? Characterize the effectiveness of this process.
- Are environmental permits viewed as a hazard control by environmental managers? By workers? Describe the process for communicating changes in environmental permits to new and ongoing projects.
- How are environmental permit limits monitored?
- Are waste management areas maintained in a safe condition? Who determines this? Describe how qualified individuals are identified to conduct this task.
- How are environmental non-compliances identified, tracked, corrected, and prevented?